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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

ZERVIGON, RUDY

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 03/12/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/926,676

Applicant(s)

HIROSE ET AL.

Examiner

Rudy Zervigon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13,15 and 16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13,15 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 June 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figure 10 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to because the line for item 17 of Figure 1 does not touch the “substrate to be processed” that rests on 16a. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “notch” (Page 15, lines 5-8) and the “electric heater” (page 15, lines 8-10) of the deposit shield must be shown or the feature canceled from the claims. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 7-9, 15, and 16 are rejected under 35 U.S.C. 102(e)ⁱ as being anticipated by Welch et al (USPat. 6,192,827). Welch teaches:

7. (Amended) A vacuum processing apparatus^{fig} comprising; a vacuum processing chamber (24; Figure 1; column 4, lines 10-21) having a stage (220; Figure 5; column 6, lines 59-67) mounting a substrate to be processed; and a carrier port (54; Figure 2; column 4, lines 22-40) provided on a peripheral wall of the vacuum processing chamber (24; Figure 1; column 4, lines 10-21), and

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carrying the substrate onto and off the stage (220; Figure 5; column 6, lines 59-67), for generating plasma (Title) in the vacuum processing chamber (24; Figure 1; column 4, lines 10-21) and for subjecting the substrate on the stage (220; Figure 5; column 6, lines 59-67) to a plasma (Title) processing, characterized by comprising: a deposit shield (50; Figure 3B; "chamber liner") disposed along an inner peripheral wall (24; Figure 1) of the vacuum processing chamber (24; Figure 1; column 4, lines 10-21); and a shutter (60; Figure 2; column 4, lines 22-40) disposed to be able to be elevated along the inner peripheral wall (24; Figure 1) of the vacuum processing chamber (24; Figure 1; column 4, lines 10-21), and characterized in that each of the deposit shield (50; Figure 3B; "chamber liner") and the shutter (60; Figure 2; column 4, lines 22-40) has a grounded (column 8, lines 9-13) potential, the shutter (60; Figure 2; column 4, lines 22-40) is retreated when the substrate is delivered into and outside through the carrier port (54; Figure 2; column 4, lines 22-40) and displaced to be abutted (Figure 5,8) on the deposit shield (50; Figure 3B; "chamber liner") when the plasma (Title) processing is conducted, and a plasma (Title) generation region is surrounded by an even curve, thereby generating uniform plasma (Title).

8. (Amended) A vacuum processing apparatus according to claim 7, characterized in that the shutter (60; Figure 2; column 4, lines 22-40) is a cylindrical member (60; Figure 2) along the inner peripheral wall (24; Figure 1) of the vacuum processing chamber (24; Figure 1; column 4, lines 10-21), the shutter (60; Figure 2; column 4, lines 22-40) raised by a shutter (60; Figure 2; column 4, lines 22-40) driving mechanism (Figure 3A,3B,6; column 4, lines 41-65) to close the carrier port (54; Figure 2; column 4, lines 22-40) when the plasma (Title) is generated in the vacuum processing chamber (24; Figure 1; column 4, lines 10-21)

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9. (Amended) A vacuum processing apparatus according to claim 7, characterized in that the shutter (60; Figure 2; column 4, lines 22-40) is a plate member (60; Figure 6) along the inner peripheral wall (24; Figure 1) of the vacuum processing chamber (24; Figure 1; column 4, lines 10-21), and the deposit shield (50; Figure 3B; "chamber liner") is a cylindrical member (60; Figure 2) having a notch portion (94,96; Figure 9, 10) facing the carrier port (54; Figure 2; column 4, lines 22-40); and when the plasma (Title) is generated in the vacuum processing chamber (24; Figure 1; column 4, lines 10-21), the shutter (60; Figure 2; column 4, lines 22-40) is fitted into the notch portion (94,96; Figure 9, 10) by a shutter (60; Figure 2; column 4, lines 22-40) driving mechanism (Figure 3A,3B,6; column 4, lines 41-65) to close the carrier port (54; Figure 2; column 4, lines 22-40)

Welch further teaches:

15. (Added) A vacuum processing apparatus including a vacuum processing chamber (24; Figure 1; column 4, lines 10-21) having a stage (220; Figure 5; column 6, lines 59-67) mounting a substrate to be processed; and a carrier port (54; Figure 2; column 4, lines 22-40) for carrying the substrate onto and off the stage (220; Figure 5; column 6, lines 59-67), for generating plasma (Title) in the vacuum processing chamber (24; Figure 1; column 4, lines 10-21) and for subjecting the substrate on the stage (220; Figure 5; column 6, lines 59-67) to a plasma (Title) processing, characterized by comprising: a deposit shield (50; Figure 3B; "chamber liner") disposed along an inner peripheral wall (24; Figure 1) of the vacuum processing chamber (24; Figure 1; column 4, lines 10-21), and having a notch portion (94,96; Figure 9, 10) at a position facing the carrier port (54; Figure 2; column 4, lines 22-40); and a shutter (60; Figure 2; column 4, lines 22-40) having a shape fitted into the notch portion (94,96; Figure 9, 10) of the deposit

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shield (50; Figure 3B; "chamber liner"), having an inside forming a same curve as a curve of an inner surface of the deposit shield (50; Figure 3B; "chamber liner") when the shutter (60; Figure 2; column 4, lines 22-40) is fitted into the notch portion (94,96; Figure 9, 10), and disposed to be able to be elevated, and characterized in that each of the deposit shield (50; Figure 3B; "chamber liner") and the shutter (60; Figure 2; column 4, lines 22-40) has a ground potential (column 8, lines 9-13), the shutter (60; Figure 2; column 4, lines 22-40) is retreated to pass through the notch portion (94,96; Figure 9, 10) to carry the substrate when carrying the substrate inside and outside through the carrier port (54; Figure 2; column 4, lines 22-40), the shutter (60; Figure 2; column 4, lines 22-40) is displaced to be fitted into the notch portion (94,96; Figure 9, 10) of the deposit shield (50; Figure 3B; "chamber liner") when the plasma (Title) processing is conducted, and a plasma (Title) generation region is surrounded by the even curve, thereby producing uniform plasma (Title).

16. (Added) A vacuum processing apparatus according to claim 15, characterized in that when the plasma (Title) is generated in the vacuum processing chamber (24; Figure 1; column 4, lines 10-21), the shutter (60; Figure 2; column 4, lines 22-40) is raised by a shutter (60; Figure 2; column 4, lines 22-40) mechanism to be fitted into the notch portion (94,96; Figure 9, 10) to thereby close the carrier port (54; Figure 2; column 4, lines 22-40) and an inner surface of the shutter (60; Figure 2; column 4, lines 22-40) forms the same curve as the curve of the inner surface of the deposit shield (50; Figure 3B; "chamber liner").

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Welch et al (USPat. 6,192,827) in view of Franklin et al (USPat. 5,965,046). Welch teaches a vacuum processing apparatus (Figure 1) comprising:

- i. a vacuum processing chamber (24; Figure 1; column 4, lines 10-21) having a stage (220; Figure 5; column 6, lines 59-67) mounting a substrate to be processed; and a carrier port (54; Figure 2; column 4, lines 22-40) provided on a peripheral wall of the vacuum processing chamber (24; Figure 1; column 4, lines 10-21), and carrying the substrate onto and off the stage (220; Figure 5; column 6, lines 59-67), for generating plasma (Title) in the vacuum processing chamber (24; Figure 1; column 4, lines 10-21) and for subjecting the substrate on the stage (220; Figure 5; column 6, lines 59-67) to a plasma (Title) processing, characterized by comprising:
- ii. a shutter (60; Figure 2; column 4, lines 22-40), retreated when the substrate is delivered onto and off the stage (220; Figure 5; column 6, lines 59-67), and disposed to cover a surrounding (50) of the stage (220; Figure 5; column 6, lines 59-67) and to surround a plasma (Title) generation region while closing the carrier port (54; Figure 2; column 4, lines 22-40) when the plasma (Title) is generated in the vacuum processing chamber (24; Figure 1; column 4, lines 10-21)

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- iii. the shutter (60; Figure 2; column 4, lines 22-40) is a cylindrical member (60; Figure 2) along an inner peripheral wall (50; Figure 2) of the vacuum processing chamber (24; Figure 1; column 4, lines 10-21), the shutter (60; Figure 2; column 4, lines 22-40) raised by a shutter (60; Figure 2; column 4, lines 22-40) driving mechanism (Figure 3A,3B,6; column 4, lines 41-65) to close the carrier port (54; Figure 2; column 4, lines 22-40) when the plasma (Title) is generated in the vacuum processing chamber (24; Figure 1; column 4, lines 10-21)
- iv. the shutter (60; Figure 2; column 4, lines 22-40) driving mechanism (Figure 3A,3B,6; column 4, lines 41-65) is constituted of an air cylinder (112,110; Figure 6) disposed on an atmospheric area side (32, Figure 6), and a driving shaft elevated by the air cylinder (112,110; Figure 6) to elevate the shutter (60; Figure 2; column 4, lines 22-40)
- v. the shutter (60; Figure 2; column 4, lines 22-40) is a plate member (60; Figure 6) along an inner peripheral wall (50; Figure 2) of the vacuum processing chamber (24; Figure 1; column 4, lines 10-21), the shutter (60; Figure 2; column 4, lines 22-40) raised by a shutter (60; Figure 2; column 4, lines 22-40) driving mechanism (Figure 3A,3B,6; column 4, lines 41-65) to close the carrier port (54; Figure 2; column 4, lines 22-40) when the plasma (Title) is generated in the vacuum processing chamber (24; Figure 1; column 4, lines 10-21)
- vi. the shutter (60; Figure 2; column 4, lines 22-40) driving mechanism (Figure 3A,3B,6; column 4, lines 41-65) is constituted of the air cylinder (112,110; Figure 6) disposed on the atmospheric area side (32, Figure 6), and the driving shaft elevated by the air cylinder (112,110; Figure 6) and elevating the shutter (60; Figure 2; column 4, lines 22-40)
- vii. a potential of the shutter (60; Figure 2; column 4, lines 22-40) is grounded (column 8, lines 9-13)

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Welch does not teach a heating mechanism in his shutter assembly.

Franklin teaches a similar gate valve (6, Figure 1) for a plasma apparatus (column 3, lines 58-65; column 4, lines 13-25). The gate valve further includes a heater (9; column 4, line 66 – column 5, line 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Franklin's heater to Welch's gate valve.

Motivation to add Franklin's heater to Welch's gate valve is to "drive off contaminants" (column 4, line 67) as taught by Franklin.

10. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Welch et al (USPat. 6,192,827) in view of Osaka et al (JP11-037315) and Maa (USPat. 4,771,805). Welch is discussed above. Welch further teaches an end face (96/60 interface; Figure 10) of the shutter (60; Figure 2; column 4, lines 22-40) on the deposit shield (50; Figure 3B; "chamber liner") side, the end face is formed to have an Z-shape to be engaged with an end face of the notch portion (94,96; Figure 9, 10) so as to have a convex outer periphery on the end face of the shutter (60; Figure 2; column 4, lines 22-40).

However, Welch does not teach a shutter with a groove for fitting an o-ring thereinto formed on the stage side, and a groove for fitting a spiral seal made of metal thereinto is formed on an outer periphery on the groove.

Osaka teaches a gate valve shutter (32) with a groove (32/33 contour; Figure 2) for fitting an o-ring (33 – see corresponding element on the other side of 32). Osaka does not teach the material of construction for the seal member. Maa teaches a metallic seal for a gate valve (column 1, lines 22-51).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to add metallic seal members to Welch's gate valve as taught by Osaka and Maa.

Motivation to add metallic seal members to Welch's gate valve as taught by Osaka and Maa is to provide for a better hermetic seal between Welch's gate valve and seat therefor as taught by Osaka ("[Description of the Prior ART]"; Machine Translation).

11. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Welch et al (USPat. 6,192,827) in view of Steger et al (USPat. 5,788,799). Welch is discussed above. However, Welch does not teach a deposit shield (50; Figure 3B; "chamber liner") comprising a heating mechanism.

Steger teaches a similar plasma apparatus (Figure 1) including a chamber liner (102; column 6, lines 18-29) comprising a heating mechanism (110, Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a heater in Welch's liner as taught by Steger.

Motivation to add a heater in Welch's liner as taught by Steger is to provide for thermal protection of the liner (column 6, lines 18-29).

12. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Welch et al (USPat. 6,192,827) in view of Hamrah et al (USPat. 5,242,538). Welch is discussed above. However, Welch does not teach a disk-shaped evacuation plate disposed around the stage.

Hamrah teaches a similar plasma processing apparatus (Figure 2) including a disk-shaped evacuation plate (96; Figure 2; column 3, lines 14-29) disposed around the stage (70).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a disk-shaped evacuation plate disposed around Welch's support stage as taught by Hamrah.

Motivation to add a disk-shaped evacuation plate disposed around Welch's support stage is to direct exhaust flow as taught by Hamrah (column 3, lines 14-29).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. JP10-132095

USPat. 6,074,953; 5,120,019; 5,945,354; 6,394,026; 6,408,786; 4,721,282; 4,433,951; 4,721,282; 5,363,872; 5,613,821; 5,820,723; 6,056,823; 5,456,480; 5,651,670; 6,284,006; 6,002,572; 6,456,480

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.


JEFFRIE R. LUND
PRIMARY EXAMINER

ⁱ Recent Statutory Changes to 35 U.S.C. § 102(e)

On November 2, 2002, President Bush signed the 21st Century Department of Justice Appropriations Authorization Act (H.R. 2215) (Pub. L. 107-273, 116 Stat. 1758 (2002)), which further amended 35 U.S.C. § 102(e), as revised by the American Inventors Protection Act of 1999 (AIPA) (Pub. L. 106-113, 113 Stat. 1501 (1999)). The revised provisions in 35 U.S.C. § 102(e) are completely retroactive and effective immediately for all applications being examined or patents being reexamined. Until all of the Office's automated systems are updated to reflect the revised statute, citation to the revised statute in Office actions is provided by this attachment. This attachment also substitutes for any citation of the text of 35 U.S.C. § 102(e), if made, in the attached Office action.

The following is a quotation of the appropriate paragraph of 35 U.S.C. § 102 in view of the AIPA and H.R. 2215 that forms the basis for the rejections under this section made in the attached Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

35 U.S.C. § 102(e), as revised by the AIPA and H.R. 2215, applies to all qualifying references, except when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. For such patents, the prior art date is determined under 35 U.S.C. § 102(e) as it existed prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. § 102(e)).

The following is a quotation of the appropriate paragraph of 35 U.S.C. § 102 prior to the amendment by the AIPA that forms the basis for the rejections under this section made in the attached Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

For more information on revised 35 U.S.C. § 102(e) visit the USPTO website at www.uspto.gov or call the Office of Patent Legal Administration at (703) 305-1622.